



# Gasoline Safety

A 5-Minute Safety Training Aid

Gasoline is a major fuel source to power vehicles, lawnmowers, boats, motorcycles, snowblowers, tractors, and some light planes. It is a vital part of everyday life. However, failing to properly handle and store it can lead to illnesses, injuries, fires, explosions, and other disasters.

Gasoline is a listed hazardous material in the [Code of Federal Regulations 172.101](#). It is a pale brown or pink liquid made from processed crude oil. It evaporates easily, is very flammable, and can form explosive mixtures in air. A typical gasoline mixture contains about 150 different [hydrocarbons](#), plus added chemicals such as lubricants, anti-rust agents, and anti-icing agents.<sup>1</sup> Some gasoline also contains [ethanol](#), which is made from corn. Ethanol, too, is a toxic chemical that should be treated and handled as such, whether at work or in the home.<sup>2</sup>



## Physical Hazards

**Fire and explosion** are the primary physical hazards of gasoline. Gasoline is highly flammable.<sup>3</sup> While flammable and combustible liquids themselves do not burn, it is the mixture of their vapors and air that burns. Gasoline, with a flashpoint of -40°F, is considered a flammable liquid.<sup>4</sup> Even at temperatures as low as -40°F, it gives off enough vapor to form a burnable mixture in air.

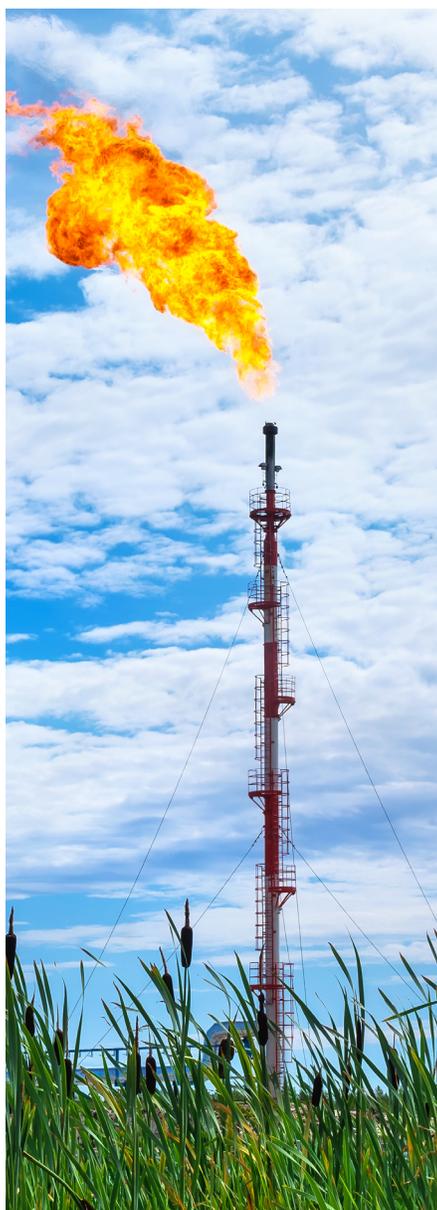
Because gasoline vapor is heavier than air it **accumulates in low-lying areas, especially in confined spaces**. Also, because gasoline is less dense than water, it can **float on water, spreading fire**. It can also **produce a static charge**. Any ignition source – a cigarette, match, hot exhaust pipe, or spark of any kind -- can ignite gasoline vapors. If gasoline vapors ignite, one gallon of gasoline can explode with the same force as 14 sticks of dynamite.<sup>5</sup>



Office of Risk Management



## Health Hazards



Gasoline exposure can cause serious health effects. The major routes of gasoline exposure are:

- **Inhalation**  
Prolonged breathing of gasoline vapors can lead to nose and throat irritation, headaches, dizziness, nausea, vomiting, confusion, and breathing difficulties. If gasoline enters the lungs, it can also cause a potentially fatal type of [chemical pneumonia](#).
- **Skin Contact**  
Repeated and prolonged exposure to gasoline can irritate the skin, causing rashes, redness, cracked skin, and swelling. Any skin contact also involves inhalation exposure.
- **Ingestion**  
Symptoms from swallowing small amounts of gasoline (for example while siphoning gasoline) include mouth, throat, and stomach irritation, nausea, vomiting, dizziness, and headaches. Accidental gasoline swallowing results in many poisonings treated in emergency rooms each year.<sup>6</sup>
- **Long-Term Health Effects**  
The health effects of gasoline exposure over long periods are not well known. This is because people exposed to gasoline are usually exposed to other harmful chemicals. Some workers who are exposed to gasoline every day in their jobs have suffered memory loss and impaired muscle function.<sup>7</sup> At very high levels, some of the chemicals in gasoline, such as [benzene](#), are known to cause cancer. The link between benzene and cancer has largely focused on [leukemia](#) and other cancers of blood cells.<sup>8</sup> Current evidence, however, does not show that exposure to low levels of gasoline causes cancer in humans.<sup>9</sup>



## Safe Handling and Storage

When handling or storing gasoline, take all necessary safety precautions.

- Immediately report leaks, spills, or safety equipment failures.
- Eliminate heat and ignition sources such as sparks, open flames, hot surfaces, and static discharge.
- Post “No Smoking” signs.





## Safe Handling and Storage



- Do not use gasoline near welding operations or other high energy sources.
- Electrically bond and ground equipment. Ensure that ground clips contact bare metal.
- Keep a minimum amount of gasoline in storage.
- Store gasoline in a separate area from the work area.
- Store gasoline in an area that is cool, dry, well-ventilated, out of direct sunlight, and away from heat and ignition sources.
- Prevent gasoline from accidental contact with incompatible chemicals.
- Never use gasoline as a cleaner, solvent, or charcoal lighter. The vapors may float along the ground and contact an ignition source, causing an explosion.
- Wash hands after handling gasoline.
- If gasoline spills on clothing, remove the clothing immediately.
- Use gasoline in open areas with plenty of fresh air.
- Avoid prolonged breathing of gasoline vapors.





## Safet Storage and Handling

- While filling a container with gasoline, remove the container from the vehicle and place it on the ground. Never fill a container in a truck bed or trunk of a car. Keep the nozzle in contact with the container. Fill the container only 95% full to leave room for the gasoline to expand during temperature changes.
- When filling a vehicle or container with gasoline, turn off the engine and extinguish cigarettes. Never smoke or keep an open flame within 50 feet of a gas pump or any refueling activity.
- Allow gas-powered equipment, such as lawnmowers, to cool before refueling. Refueling hot powered equipment can cause the vapors to ignite or explode, resulting in severe injury or burns. Always move the gas container at least 50 feet from gas-powered equipment after fueling and before starting the machine.
- Do not leave a gasoline container in direct sun.
- When placing a container of gasoline in a vehicle, tighten both the container cap and vent cap. Secure the container so it will not slide around or tip over.
- Always place a gasoline container in the pickup bed or the car trunk. Remove the container from the vehicle as soon as possible to avoid heat building up pressure in the container.
- Never place a gasoline container in the passenger compartment of a vehicle. Placing a container of gasoline in the passenger compartment can create an inhalation and fire hazard inside the vehicle.
- Store gasoline in approved metal or plastic containers only. Look for the Underwriters' Laboratories (UL) or Canadian Standards Association (CSA) label.
- Never store gasoline in a house. Gasoline should be stored in an outside well-ventilated shed away from ignition sources or in a fireproof container.

For more information on gasoline safety, visit the [American Petroleum Institute](#), [American Burn Association](#), or [National Fire Protection Association](#).



## References

- <sup>1</sup> Illinois Department of Public Health, "Cancer in Illinois: Gasoline." Website. <http://www.idph.state.il.us/cancer/factsheets/gasoline.htm>. Accessed January 5, 2022.
- <sup>2</sup> VelocityEHS, "Ethanol: Versatile, Common, and Potentially Dangerous." Website. <https://www.ehs.com/2014/04/ethanol-versatile-common-and-potentially-dangerous/>. Accessed January 7, 2022.
- <sup>3</sup> Canadian Centre for Occupational Health and Safety, "Gasoline." Website. [https://www.ccohs.ca/oshanswers/chemicals/chem\\_profiles/gasoline.html](https://www.ccohs.ca/oshanswers/chemicals/chem_profiles/gasoline.html). Accessed January 5, 2022.
- <sup>4</sup> Canadian Centre for Occupational Health and Safety, "Flammable & Combustible Liquids – Hazards." Website. <https://www.ccohs.ca/oshanswers/chemicals/flammable/flam.html?=&wbdisable=true>. Accessed January 5, 2022.
- <sup>5</sup> NYFD Smart, "Gasoline." Website. <https://www.fdnysmart.org/gasoline/>. Accessed January 5, 2022.
- <sup>6</sup> University of Utah Health, "Dos and Don'ts in Case of Gasoline Poisoning." Website. [https://healthcare.utah.edu/the-scope/shows.php?shows=0\\_g9tzppx4](https://healthcare.utah.edu/the-scope/shows.php?shows=0_g9tzppx4). Accessed January 6, 2022.
- <sup>7</sup> Illinois Department of Public Health, "Cancer in Illinois: Gasoline." Website. <http://www.idph.state.il.us/cancer/factsheets/gasoline.htm>. Accessed January 5, 2022.
- <sup>8</sup> American Cancer Society, "Benzene and Cancer Risk." Website. <https://www.cancer.org/cancer/cancer-causes/benzene.html>. Accessed January 6, 2022.
- <sup>9</sup> US Department of Health and Human Services, "Toxicological Profile for Gasoline," PDF. <https://www.atsdr.cdc.gov/toxprofiles/tp72.pdf>. Accessed January 6, 2022.

